

## NURSING AT SCAMC: HAVE WE DONE WHAT WE SAID WE WERE GOING TO DO?

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This paper examines the papers presented in the nursing sessions at SCAMC in 1981, 1982, and 1983. The main focus of the papers presented has been on describing actual and proposed implementations of nursing applications of computer technology. Based on concepts proposed by Swazey and Reeds, the papers were analyzed to discern trends in the development of the nursing knowledge base regarding computers. No specific trends were found in log linear analysis of the data. Citation analysis using log linear model revealed a positive interaction between an author's use of clinical and technical literature, suggesting that authors rely on literature both within nursing and in related fields.

Nursing at SCAMC: Have we done what we said we were going to do?

For three years, we of the nursing profession have been formally recognized within the tracks of the Symposium for Computer Applications in Medical Care. Throughout the thirty hours of formal presentations and the countless hours spent talking with colleagues, we have offered and heard many plans, strategies, and suggestions as to how to exploit this marvelous technology to benefit nursing practice. Along with others, I have shared the excitement and frustration of belonging to the ground-swell of a new technology. There is so much to do, so much we can do, so much we are doing. I answer the title question with a qualified yes. Examination and review of the nursing activities at SCAMC show that ideas abound, some applications are spreading, and many basic problems remain unsolved.

Many things have happened here over the past three years. We have debated the desirability of an alliance with a formal organization, heard seventy-nine papers within our own sessions (and a few from other sessions), given suggestions, received suggestions, and encouraged each other to develop applications to help our practice. We have talked of records management, computerized nursing care plans, nursing research, and decision support systems. Most of us conversed rather fluently in a language never encountered

in our basic education programs. All this excitement and growth causes one to stop and ponder: are we listening to ourselves? Are we delivering what we promised?

First, let us identify who has been talking. That a nurse is an author of a paper delivered at SCAMC was not new in 1981 - rather 1981 was the first year the specific sessions were organized for and by nurses. I have focused on those papers presented in the nursing sessions at SCAMC in 1981, 1982, and 1983. Thirty-four papers were single-authored, seventeen had two or more authors, and the remainder had three or more authors. Nine persons presented two papers each, and four persons were identified as single or joint authors on three or more papers. Although it was not possible to identify the profession of all authors, most papers had at least one RN author.

Speakers came from all settings in which nurses work. No single organization or school dominated as the author's home base. Major contributions came from nurses at the National Institute of Health, the University of Michigan, and the Armed Forces. All geographic areas of the country were represented, with a preponderance of authors from East Coast areas.

Next, let us examine what people have been talking about. cursory examination of paper titles suggests that there is nothing new in our content. We are still concerned about the patient record, we still study how nurses like computers. The sense that we are moving too slowly to handle this rapidly intruding technology is one of the major issues which sparked this paper. We hear each year of some hospital's grand plan for implementing a computer system - of another's strategy for educating nurses - of yet another's survey of nurse acceptance. Is there nothing new? Is no one following the excellent advice and well-thought-out ideas?

Part of the frustration of working with a new and rapidly growing technology arises from the need to know today what was not even conceived of yesterday. We come here to learn new ideas, new strategies, and yet find that our colleagues know little more than we ourselves. I ask you to reframe the issue:

consider where we have come from and what we have done in the short span of three years. (Note 1).

In 1981, our first year with formal nursing sessions, eighteen papers were presented. Four sessions, organized along the traditional sub-domains of nursing, addressed issues of computer applications in nursing administration, research, practice, and education. Zielstorff provided a comprehensive view of nursing administration applications. Romano described computer documentation of nursing practice, and McCormick proposed a framework for nursing research using computerized data bases. Powell, Davis, and Wolf described remote support for clinical care enabled by computer technology. Simmons focused on community health applications. Education and training strategies were advanced by Guttman and Doyle, and by Ronald.

In our first year, we learned much about what our colleagues were doing and hoped to do with computers. Jacobowitz, Strodman, Lomas, and Truax proposed a patient assessment process. Brennan suggested teaching managerial decision-making concepts through computer simulation. Computer-assisted instruction sounded feasible and fascinating. Sylvester, Shipley, and Long described research activities at their institution. Reno reported implementation of the COSTAR system. Dehinger surveyed nurses' utilization of the computerized clinical record.

We also heard a great deal of sound wisdom and advice. Quaal gave criteria for evaluating computer systems. Charters offered ideas to managers about how to facilitate acceptance of a computer system. We began to scrutinize colleagues' work, having recognized the distance between a proposed implementation and an operational system.

In these early papers, we were concerned with getting started using computers: 'how-we-do-it-teach-it-use-it-research-it-here'. It was a time for a good deal of show and tell as we learned how others were coping with the new mystery. Research presentations focused on what nurses should know, or wanted to know about the computer. As is common when a new technology takes hold, presenters spoke from the wisdom of experience.

Those who attended the fifth SCAMC in 1981 may recall the feelings of excitement and camaraderie present among the nursing group. What a relief to find that there were other nurses like ourselves trying to figure out this new tool! In addition to formal papers, we had the chance to come together as a body. Several hundred nurses met that Monday evening to plan strategies for the future—networking, to use some of our newly acquired computer jargon.

1982, our second year of participation, found a more sophisticated group of 'computer nurses' in attendance. Four nursing sessions expanded to seven, with the inclusion of single sessions for CAI, networking, and

micro-computer applications. 'Computer Literacy' replaced education. Twenty-seven papers were presented.

Over one-third of the papers presented dealt with education of nurses about or with the computer. Grobe, Krull, and Tymchychyn each discussed a CAI-nursing education project. Papers by Newbern and by Carlsen addressed methods of educating nursing personnel about the computer. From the 'how to work it' of the first year, we progressed to 'how to teach others to work it.' Hollaran in one paper and Zielstorff et al. in another provided comparative evaluation of strategies to teach nurses about the computer.

The major shift in focus from the first year to the second was the move from concerns of data management to those of clinical support. Woodbury developed a computer simulation which evaluated nurses' problem-solving skills. Way, Rowley, and White described micro-computer-based nurse-practitioner protocols. Ozbolt demonstrated a two-fold feat for nursing: operationalizing a nursing theory and computerization of the operationalization.

Through papers by Edmunds, Cook, Mooney, and Romano, we learned of ways to use a hospital information system to improve nursing practice. Mertz, Ash, and Farrell with their discussion of a bedside notation system provided a solution to the problem of the computer drawing the nurse from the bedside. Research presentations in our second year had two foci: 1) the nurse's use of the computer (McCormick; Morticelli and Fischer), and 2) the computer as a data collection tool (Abbey and Close; Milholland and Ward).

Uses of micro-computer technology were discussed by several authors. Reed, and Schwirian and Byers identified ways that the micro-computer aided clinical research. Abdo, Truax, and Strodman described the reports available from micro-computer-guided nursing assessment.

The papers presented in the nursing administration section reflected the major issues in the nursing management environment. Lake and colleagues discussed the linkage of patient classification to nurse staffing levels. Reed suggested methods of quality assurance monitoring through computer technology. Conway and Segal investigated the information necessary for a nursing data base and Simpson illustrated multi-hospital management issues for an administrative support system.

In our second year we came of age. One theme strongly emerged — the computer was a tool which could support nursing practice, not simply data management. We still talked about what we were, or could be, doing with computers. We met again as a group and agreed to begin to explore affiliation. These tentative steps frustrated those who wished rapid action.

1983 found us in Baltimore attending eight sessions devoted to computers in nursing. Education re-emerged as a title and nursing practice was divided into two sessions: ambulatory care and inpatient practice. A full day tutorial on computer literacy preceded the principle sessions.

Papers were presented by some familiar speakers as well as by some new thinkers. As compared to the previous two years, greater differentiation of topics was evident. We had moved from the 'how we do it here' papers to the application of systems planning and design concepts to nursing information processing (Saba; Jacobsen; Weaver and Johnson; Reider and Houser). New acronyms and phrases appeared in our growing jargon: AI, DSS, requirements definition, "high tech-high touch."

We learned of a knowledge-based computer consultant 'in practice' in Nebraska (Ryan), and were encouraged to prepare for the arrival of the fifth generation of super-computers (Ozbolt, Schulz). Eight papers reporting existing implementations attested to the expanding use of micro-computer technology. Research presentations continued to focus on determinants of acceptance and utilization. CAI retained its status as a popular topic, with an increased emphasis on systematic design and structuring of nursing knowledge. Lest we be left with questionably effective systems, two authors proposed strategies for evaluating existing systems. Records management remained an ever-present concern which was addressed by nine papers.

Nursing attendance continued to grow. We heard the report of the task force charged with the responsibility for recommending strategies to formalize ourselves as a group. The question of which, not if, alliance remained unanswered. A temporary structure of a special interest group was approved and funded.

We are participants in the process of the integration of computers into the way we think about, document, and carry our professional mandates. Our papers give testimony to the spread of applications of computer technology through all domains of nursing. Apart from a topical history of our activities, can these papers tell us anything about the state of nursing knowledge regarding computer technology? Are we developing a solid knowledge base or simply reworking existing information? In the remainder of this paper, I offer the results of one strategy used to answer these questions.

A major indicator of the knowledge base of a profession is found in papers presented by members of the profession. Swazey and Reeds (1978) proposed a framework of knowledge dissemination which is illustrated through the literature of a profession. They describe flows of knowledge familiar to most nurses: ideas may originate in the laboratory and spread to the clinical area, or may start at the bedside and travel to the research domain.

The seventy-nine papers presented at SCAMC were examined to see if either of these proposed pathways could be found. Each paper was categorized as theoretical (containing a proposed application or conceptual discussion); application (reporting an actual implementation) or research (describing a research process). The results of this categorization are displayed in Table 1.

Table 1 Papers presented at nursing sessions, SCAMC, 1981-1983

	Year of Presentation		
	1981	1982	1983
Theory	4	7	12
Research	12	15	17
Application	2	5	5

Log linear analysis was used in this investigation. The first log linear model proposed that the expected number of papers in each category in each year is unrelated to the year in which the paper appears. If this proposition is supported, then neither of the pathways suggested by Swazey and Reeds existed in the data. If we are developing knowledge from practice, we should see an increase in theoretical papers; if theoretical understanding is influencing practice, then an increase in the number of application papers should be evident. The model was supported (Pearson's  $\chi^2 = 1.8204$ ,  $L^2 = 1.8132$ ). Thus, we conclude that there is no pathway of knowledge about computers reflected in the type of papers presented at SCAMC in years 1981-1983.

To insure that these results were not an artifact of the assignment strategy, sensitivity analysis was conducted. In the analysis the ranges of actual cell counts were varied, while the year totals were held constant. This process had the effect of validating that incorrect categorization of as many as eight papers did not alter the results.

Perhaps three years is too short a time to see the flow of knowledge. Then, too, it is plausible that the papers were written in a particular manner to make them acceptable at a symposium, and not for the purpose of verifying the knowledge state of a field. If the types of papers did not show a definable pathway of knowledge, a citation analysis might reveal the origin of the existing knowledge.

Citation analysis gives a measure of how ideas are spread through a profession. A log linear model was also applied to the citation counts in the papers. The twenty-three papers (34%) contained no citations, and therefore were excluded from this section of the analysis. The remaining fifty-six papers included five which did not cite the nursing literature at all. It was proposed that as nurses became more knowledgeable about computer technology, there would be an increase in the number of citations to the nursing literature. An increase in the citations to the nursing

literature could be interpreted to mean that nurses were both writing more about computers and integrating computer technology into the general fund of nursing knowledge.

When the fifty-six papers which included some citations were examined in a hierarchical model, one strong relationship was identified. Over three years, there was some interaction pattern between citation of other (non-nursing) literature and citation of the nursing literature. The interaction discovered in the hierarchical model can be interpreted in this manner. In all three years citations to both the nursing and the non-nursing literature are more common than any other citation behavior (no citations, citation to non-nursing only; citation to nursing only). If any literature is cited, authors of nursing papers will draw from both the nursing and non-nursing sources. A flow of knowledge from outside the field of nursing into nursing co-exists with a reliance on the nursing literature.

Gross examination of citation patterns was not sufficiently sensitive to indicate an actual growth in nursing knowledge about computers. cursory review of both the nursing and non-nursing literature cited revealed that nurses were just as likely to cite clinical publications in support of their papers as they were to cite technical (computer) publications. Authors frequently cited their own work as well as papers presented in earlier sessions of the symposium.

No pathway of knowledge is evident from examining either the type of papers presented. A slight trend is evident from the examination of the citation patterns, suggesting a continued flow of knowledge from outside the profession into nursing. This process suggests that one of the primary functions occurring through nursing's participation at SCAMC is the transmission and translation of knowledge from related fields into nursing.

#### Conclusion

A descriptive and statistical examination of the papers presented at SCAMC in the nursing sessions between 1981 and 1983 revealed a wealth of ideas and questions, but no evidence of any trends in the flow of knowledge. This result does in fact confirm a sense held by many that there is nothing new - does it imply that we have not done what we said we were going to do?

Absolutely not!! Perhaps our urgency to respond to the challenge of computers precluded us from stating our purposes and goals. In our effort to react we have made many promises. The exploration presented above confirms that we have developed responses to computer technology in nursing, and along the way have established a core of knowledge. We have proven ourselves capable of the task of interpreting technical knowledge within our practice domain. We need to continue to come

together to share knowledge and experience, but are certainly ready to begin to scrutinize programs and papers presented by our colleagues. We need more papers investigating the effectiveness of the wisdom advanced here year after year. We need to define application goals now that our new-ness period of adjustment is over.

The course we have taken, as evidenced by the citation pattern, is that we will still rely on our clinical literature as the frame of reference for our work. As a clinical discipline, to do any less would be to abdicate our responsibilities as professionals. However, we must continue to integrate technological developments into clinical practice literature.

Note 1: For the sake of conserving space citations to papers published in SCAMC will not be listed.

#### Reference:

Swazey, J., and Reeds, K. Today's medicine, tomorrow's science. Essays on the paths of discovery in biomedical sciences. DHEW Pub. No. (NIH) 78-244.